

| | | | | | | | | | | | | | | |
|---------------|--|--|--|--|--|-----------------|---|---|---|---|---|---------|------------|--|
| Centre No. | | | | | | Paper Reference | | | | | | Surname | Initial(s) | |
| Candidate No. | | | | | | 1 | 3 | 8 | 0 | / | 3 | H | Signature | |

Paper Reference(s)

1380/3H

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 3 (Non-Calculator)

Transformation of Curves

Past Paper Questions

Arranged by Topic

Model Answers

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers

Nil

Examiner's use only

| | | |
|--|--|--|
| | | |
|--|--|--|

Team Leader's use only

| | | |
|--|--|--|
| | | |
|--|--|--|



Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.

Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper.

You must NOT write on the formulae page.

Anything you write on the formulae page will gain NO credit.

If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 26 questions in this question paper. The total mark for this paper is 100.

There are 24 pages in this question paper. Any blank pages are indicated.

Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

Lots more free papers at:

<http://bland.in>

Compiled by Peter Bland

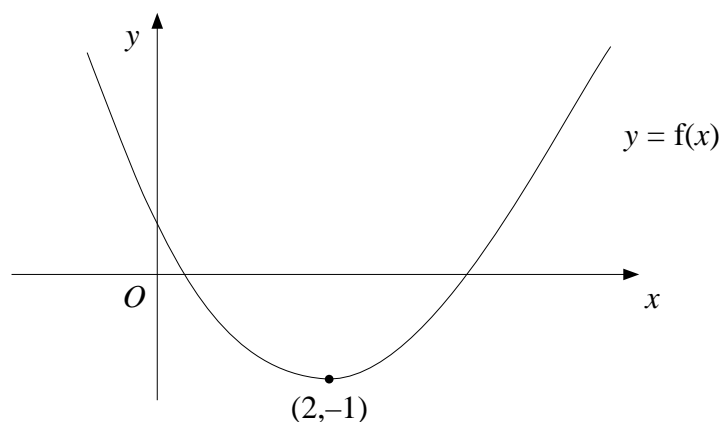
Model Answers copyright 2012



Turn over

edexcel 
advancing learning, changing lives

1.



The diagram shows part of the curve with equation $y = f(x)$
The minimum point of the curve is at $(2, -1)$

(a) Write down the coordinates of the minimum point of the curve with equation

- (i) $y = f(x + 2)$
Graph moves left 2 0, -1
(ii) $y = 3f(x)$
Stretch y by 3, $-1 \times 3 = -3$ 2, -3
(iii) $y = f(2x)$
Shrink x by 2 1, -1
(3)

The curve $y = f(x)$ is reflected in the y axis.

(b) Find the equation of the curve following this transformation.

Reflect in y-axis

$$y = \dots f(-x) \dots \quad (1)$$

The curve with equation $y = f(x)$ has been transformed to give the curve with equation $y = f(x) + 2$

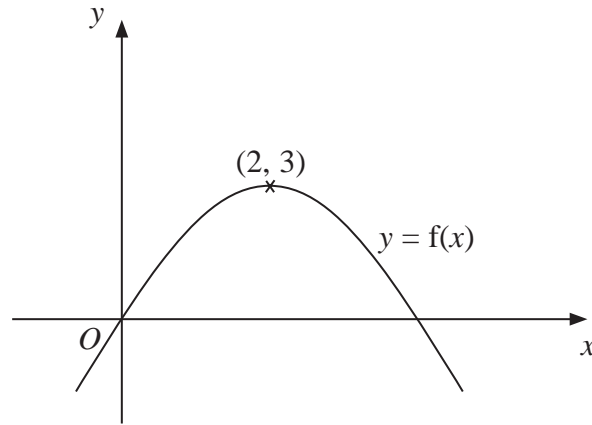
(c) Describe the transformation.

..... Translation by 2 units parallel to the y-axis. (Graph moves up 2)
(1)

(Total 5 marks)

Q1

2.



The diagram shows part of the curve with equation $y = f(x)$.
The coordinates of the maximum point of this curve are (2, 3).

Write down the coordinates of the maximum point of the curve with equation

(a) $y = f(x - 2)$

Move graph right 2.

(...4..... , ...3.....)
(1)

(b) $y = 2f(x)$

Stretch y by 2

(...2..... , ...6.....)
(1)

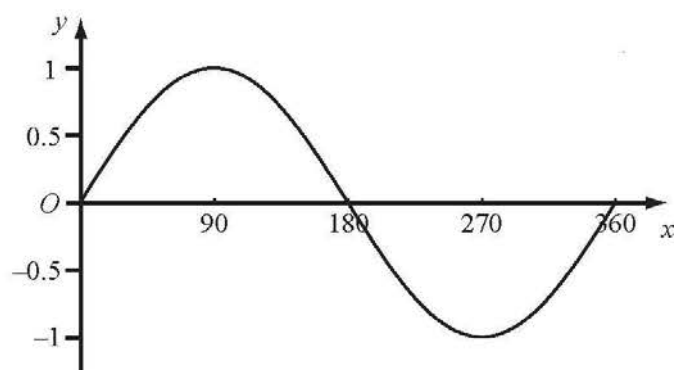
Q2

(Total 2 marks)

Summary of rules

| | | |
|------------|---------|---------------------|
| $f(x) + 2$ | $y + 2$ | (move graph up 2) |
| $f(x + 2)$ | $x - 2$ | (move graph left 2) |
| $2f(x)$ | $2y$ | (stretch y by 2) |
| $f(2x)$ | $x/2$ | (shrink x by 2) |
| $-f(x)$ | | Reflect in x-axis |
| $f(-x)$ | | Reflect in y-axis |

3. The diagram shows a sketch of the curve $y = \sin x^\circ$ for $0 \leq x \leq 360$



The exact value of $\sin 60^\circ = \frac{\sqrt{3}}{2}$

Stretch y by 4, shrink x by 2

(a) Write down the exact value of

(i) $\sin 120^\circ$,

$$\frac{\sqrt{3}}{2}$$

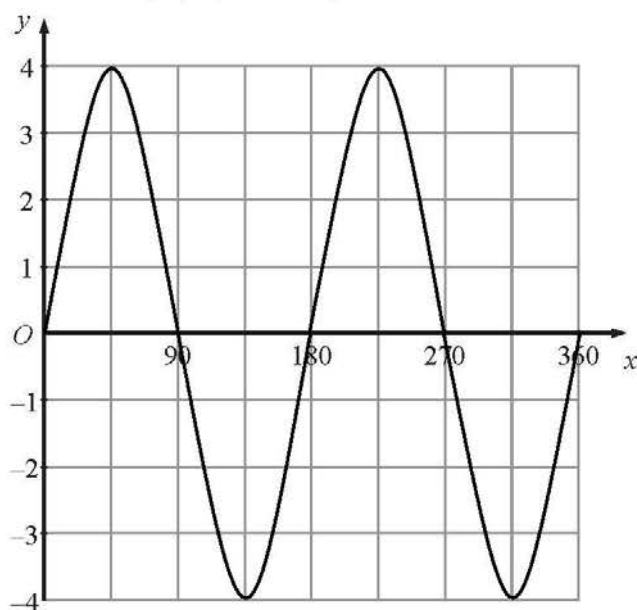
(ii) $\sin 240^\circ$.

$$-\frac{\sqrt{3}}{2}$$

(2)

(b) On the grid below, sketch the graph of $y = 4 \sin 2x^\circ$ for $0 \leq x \leq 360$

Stretch y by 4, shrink x by 2

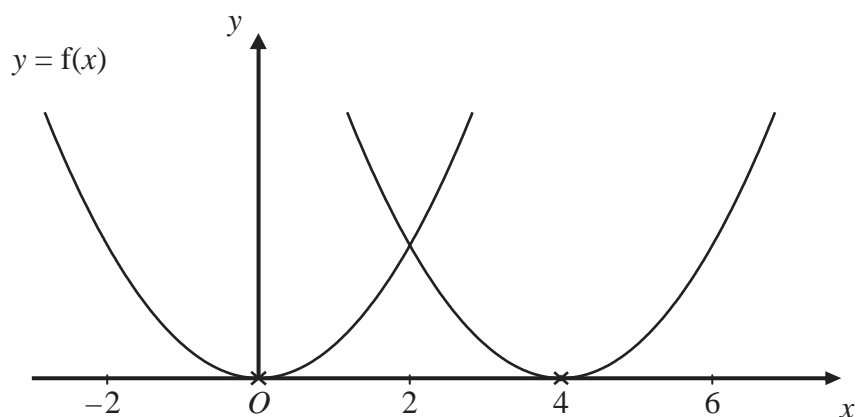


(2)

Q3

(Total 4 marks)

4.

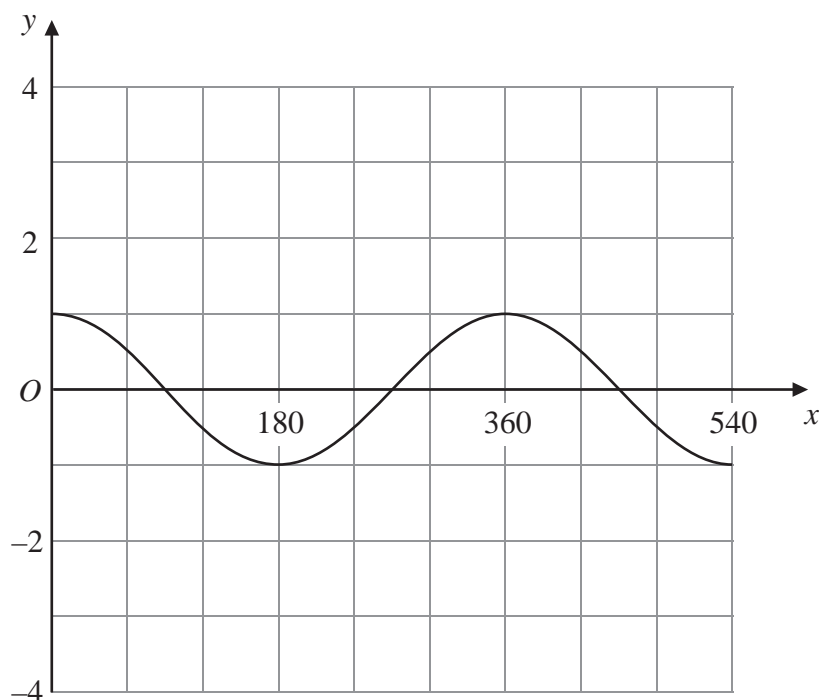


The curve with equation $y = f(x)$ is translated so that the point at $(0, 0)$ is mapped onto the point $(4, 0)$.

- (a) Find an equation of the translated curve.

Graph moved to the right by 4

..... $y = f(x - 4)$
(2)



The grid shows the graph of $y = \cos x^\circ$ for values of x from 0 to 540

- (b) On the grid, sketch the graph of $y = 3 \cos(2x^\circ)$ for values of x from 0 to 540

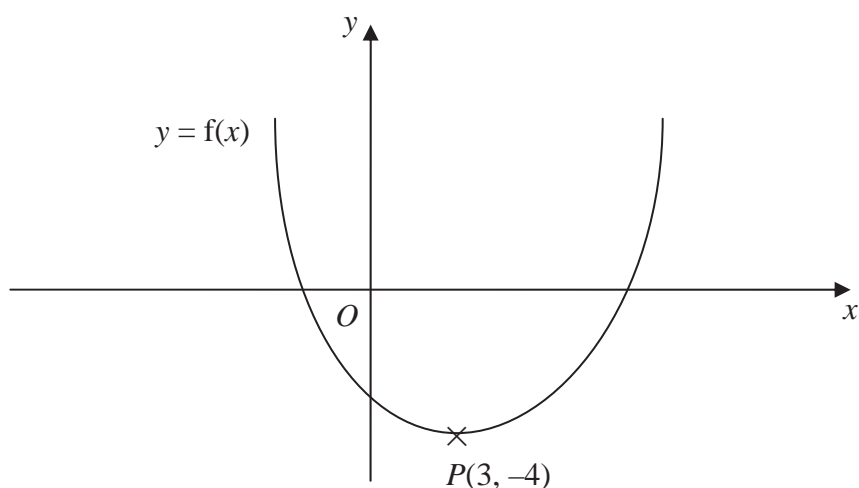
Stretch y by 3, shrink x by 2

(2)

Q4

(Total 4 marks)

5. This is a sketch of the curve with the equation $y = f(x)$.
The only minimum point of the curve is at $P(3, -4)$.



- (a) Write down the coordinates of the minimum point of the curve with the equation $y = f(x - 2)$

Graph moves right 2

(.....5.....,-4.....)
(2)

- (b) Write down the coordinates of the minimum point of the curve with the equation $y = f(x + 5) + 6$

Graph moves left 5 and up 6

$$3 - 5 = -2$$

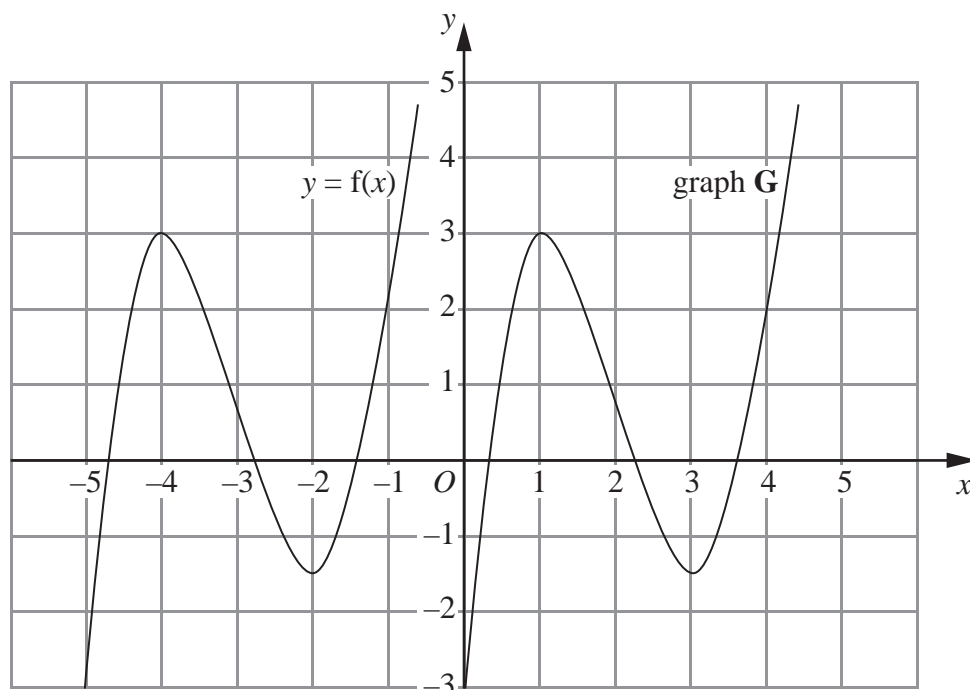
$$-4 + 6 = 2$$

(.....-2.....,2.....)
(2)

(Total 4 marks)

Q5

6. The graph of $y = f(x)$ is shown on the grid.



The graph **G** is a translation of the graph of $y = f(x)$.

(a) Write down, in terms of f , the equation of graph **G**.

Graph has moved right by 5

This is shown as $y = f(x - 5)$

$$y = \dots f(x - 5) \dots \quad (1)$$

The graph of $y = f(x)$ has a maximum point at $(-4, 3)$.

(b) Write down the coordinates of the maximum point of the graph of $y = f(-x)$.

$y = f(-x)$ means reflect in the y -axis.

The maximum point is $(4, 3)$

$$(\dots 4 \dots, \dots 3 \dots) \quad (2)$$

Q6

(Total 3 marks)

TOTAL FOR PAPER: 22 MARKS

END

BLANK PAGE